

**WHAT IS CLAIMED IS:**

1                   1.       A distributed sensing system in a networked environment for  
2 identifying an analyte, said system comprising:

3                   a first sensor array connected to said network comprising sensors capable of  
4 producing a first response in the presence of a chemical stimulus;

5                   a second sensor array connected to said network comprising sensors capable of  
6 producing a second response in the presence of a physical stimulus; and

7                   a computer connected to said network having an algorithm wherein said first  
8 response and said second response are processed to identify said analyte.

1                   2.       The system according to claim 1, wherein said algorithm selects  
2 the most relevant sensor modality in said first and said second array to identify said  
3 analyte.

1                   3.       The system according to claim 1, wherein each sensor of said first  
2 sensor array is a member selected from the group consisting of a bulk conducting polymer  
3 film, a semiconducting polymer sensor, a surface acoustic wave device, a fiber optic  
4 micromirror, a quartz crystal microbalance, a conducting/nonconducting regions sensor, a  
5 dye impregnated polymeric coatings on optical fiber and combinations thereof.

1                   4.       The system according to claim 1, wherein each sensor of said  
2 second sensor array is a member selected from the group consisting of an optical sensor, a  
3 mechanical sensor, a radiation sensor, a thermal sensor and combinations thereof.

1                   5.       The system according to claim 3, wherein each sensor of said first  
2 sensor array is a conducting/nonconducting regions sensor.

1                   6.       The system according to claim 4, wherein each sensor of said  
2 second sensor array is an optical sensor, a mechanical sensor, a radiation sensor, a  
3 thermal sensor and combinations thereof.

1                   7.       The system according to claim 1, wherein the transmission of said  
2 first response is conducted via wired communications.

1                   8.       The system according to claim 1, wherein the transmission of said  
2 first response is conducted via wireless communications.

1           9.     The system according to claim 8, wherein said wireless  
2 communications are implemented using communications technologies selected from a  
3 member of a group consisting of infrared technology, satellite technology, microwave  
4 technology and radio wave technology.

1           10.    The system according to claim 1, wherein said networked  
2 environment is a member selected from the group consisting of a worldwide computer  
3 network, an internet, the Internet, a wide area network, a local area network, an intranet  
4 and combinations thereof.

1           11.    The system according to claim 1, wherein said networked  
2 environment is the Internet.

1           12.    A device for monitoring an analyte in an environment, said device  
2 comprising:

3               at least one sensor array, wherein said at least one sensor array comprises  
4 at least two sensors capable of producing a first response in the presence of a chemical  
5 stimulus;

6               a second sensor which is capable of producing a second response in the  
7 presence of a physical stimulus;

8               a connector that connects said at least one sensor array and said second  
9 sensor to a central processing unit, said central processing unit collects and stores said  
10 first and second responses; and

11              an analyzer configured to analyze a plurality of responses wherein said  
12 analyzer monitors said analyte in said environment.

1           13.    The device according to claim 12, wherein said second sensor is an  
2 array of sensors.

1           14.    The device according to claim 12, wherein said device is a  
2 handheld device.

1           15.    The device according to claim 12, wherein each of said at least two  
2 sensors is a member selected from the group consisting of a bulk conducting polymer  
3 film, a semiconducting polymer sensor, a surface acoustic wave device, a fiber optic

4 micromirror, a quartz crystal microbalance, a conducting/nonconducting regions sensor, a  
5 dye impregnated polymeric coatings on optical fiber and combinations thereof.

1 16. The device according to claim 15, wherein each of said at least two  
2 sensors is a conducting/nonconducting regions sensor.

1 17. The device according to claim 13, wherein each sensor in said  
2 second sensor array is a member selected from the group consisting of an optical sensor, a  
3 mechanical sensor, a radiation sensor, a thermal sensor and combinations thereof.

1 18. The device according to claim 14, wherein said handheld device  
2 further comprises a communication interface coupled to the processing device and  
3 configured to communicate with a computer network.

1 19. A method for transferring a combination of chemical and physical  
2 data over a computer network for identification of an analyte, said method comprising:  
3 transmitting sensory data from a first sensor array comprising sensors  
4 capable of producing a first response in the presence of a chemical stimulus to a remote  
5 location;  
6 transmitting physical data from a second sensor array comprising sensors  
7 capable of producing a second response in the presence of a physical stimulus to a remote  
8 location; and  
9 processing said sensory and physical data at said remote location for  
10 identification of an analyte.

1 20. The method according to claim 1, further comprising employing a  
2 sensor selection algorithm to determine sensors in said first array.

1 21. The method according to claim 1, wherein each sensor of said first  
2 sensor array is a member selected from the group consisting of a bulk conducting polymer  
3 film, a semiconducting polymer sensor, a surface acoustic wave device, a fiber optic  
4 micromirror, a quartz crystal microbalance, a conducting/nonconducting regions sensor, a  
5 dye impregnated polymeric coatings on optical fiber and combinations thereof.

- 1                    22.    The method according to claim 1, wherein each sensor of said  
2    second sensor array is a member selected from the group consisting of an optical sensor, a  
3    mechanical sensor, a radiation sensor, a thermal sensor and combinations thereof.

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